



[6450-01-P]

DEPARTMENT OF ENERGY

Office of Energy Efficiency and Renewable Energy

[Case No. DW-011]

Energy Conservation Program for Consumer Products: Decision and Order Granting a Waiver to Whirlpool Corporation from the Department of Energy Residential Dishwasher Test Procedure

AGENCY: Office of Energy Efficiency and Renewable Energy, Department of Energy.

ACTION: Decision and Order.

SUMMARY: The U.S. Department of Energy (DOE) gives notice of the decision and order (Case No. DW-011) that grants to Whirlpool Corporation (Whirlpool) a waiver from the DOE dishwasher test procedure. The waiver pertains to the models of dishwasher equipped with a “water use system” specified in Whirlpool’s petition. Under today’s decision and order, Whirlpool shall be required to test and rate its KitchenAid brand dishwasher equipped with a “water use system” using an alternate test procedure that takes this technology into account when measuring energy and water consumption.

DATES: This Decision and Order is effective **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]**.

FOR FURTHER INFORMATION CONTACT: Mr. Bryan Berringer, U.S. Department of Energy, Building Technologies Program, Mail Stop EE-2J, Forrestal Building, 1000 Independence Avenue, SW, Washington, DC 20585-0121. Telephone: (202) 586-0371. E-mail: Bryan.Berringer@ee.doe.gov.

Ms. Elizabeth Kohl, U.S. Department of Energy, Office of the General Counsel, Mail Stop GC-71, Forrestal Building, 1000 Independence Avenue, SW., Washington, DC 20585-0103. Telephone: (202) 586-7796. E-mail: Elizabeth.Kohl@hq.doe.gov.

SUPPLEMENTARY INFORMATION: In accordance with Title 10 of the Code of Federal Regulations (10 CFR), Section 430.27(l), DOE gives notice of the issuance of its decision and order as set forth below. The decision and order grants Whirlpool a waiver from the applicable residential dishwasher test procedure at 10 CFR part 430 subpart B, appendix C1, for the KitchenAid brand basic model KDTE554C++# dishwasher equipped with a “water use system” as specified in its petition, provided that Whirlpool tests and rates such products using the alternate test procedure described in this notice. Today’s decision prohibits Whirlpool from making representations concerning the energy efficiency of these products unless the product has been tested in a manner consistent with the provisions and restrictions in the alternate test procedure set forth in the decision and order below, and the representations fairly disclose the test results.

Distributors, retailers, and private labelers are held to the same standard when making representations regarding the energy efficiency of these products.

Issued in Washington, DC, on October 28, 2013.

Kathleen B. Hogan,
Deputy Assistant Secretary for Energy Efficiency,
Energy Efficiency and Renewable Energy.

Decision and Order

In the Matter of: Whirlpool Corporation (Case No. DW-011)

Background

Title III, Part B of the Energy Policy and Conservation Act of 1975 (EPCA), Pub. L. 94-163 (42 U.S.C. 6291-6309, as codified) established the Energy Conservation Program for Consumer Products Other Than Automobiles, a program covering most major household appliances, which includes dishwashers.¹ Part B includes definitions, test procedures, labeling provisions, energy conservation standards, and the authority to require information and reports from manufacturers. Further, Part B authorizes the Secretary of Energy to prescribe test procedures that are reasonably designed to produce results which measure energy efficiency, energy use, water use, or estimated operating costs, and that are not unduly burdensome to conduct. 42 U.S.C. 6293(b)(3). The test procedure for dishwashers is contained in 10 CFR part 430, subpart B, appendix C1.

DOE's regulations contain provisions allowing a person to seek a waiver from the test procedure requirements for covered consumer products if at least one of the following conditions is met: (1) the petitioner's basic model contains one or more design characteristics that prevent testing according to the prescribed test procedure, or (2) when the prescribed test procedures may evaluate the basic model in a manner so unrepresentative of its true energy consumption characteristics as to provide materially inaccurate comparative data. (10 CFR 430.27(a)(1))

¹ For editorial reasons, upon codification in the U.S. Code, Part B was re-designated Part A.

Petitioners must include in their petition any alternate test procedures known to the petitioner to evaluate the basic model in a manner representative of its energy consumption characteristics.

The Assistant Secretary for Energy Efficiency and Renewable Energy (the Assistant Secretary) may grant a waiver subject to conditions, including adherence to alternate test procedures. (10 CFR 430.27(l)) Waivers remain in effect pursuant to the provisions of 10 CFR 430.27(m).

On July 3, 2013, Whirlpool submitted the petition for waiver and interim waiver from the test procedure applicable to dishwashers set forth in 10 CFR part 430, subpart B, appendix C1. Whirlpool seeks a waiver from the applicable test procedure for its KitchenAid brand basic model KDTE554C++# dishwasher equipped with a “water use system” because, Whirlpool asserts, design characteristics of this basic model prevent testing in accordance with the currently prescribed test procedure and will lead to results that are materially inaccurate and mislead consumers.

Whirlpool states that the dishwasher “water use system” saves water from the final rinse of a given dishwasher cycle for use in a subsequent dishwasher cycle. If not operated for three or more days, the dishwasher will "drain out" the saved water. The dishwasher also performs a "clean out" every thirty days or thirty cycles, whichever occurs first. Both “drain out” and “clean out” events consume additional water and energy during the subsequent cycle. This additional water and energy consumption are accounted for in the waiver petition. The “water use system” is installed on soil-sensing model dishwashers that utilize 120 degree (deg.) Fahrenheit (F) inlet

water. A “drain out” event consumes an additional 1.02 gallons of water for a cycle in which it occurs. The “clean out” event consumes an additional 1.24 gallons of water for a cycle in which it occurs. “Drain out” and “clean out” events occur during the active mode, but before the power dry portion of the cycle begins. The power dry, fan-only mode, inactive mode, and off mode are not affected by “water use system” operation water consumption or energy consumption.

Whirlpool provided an alternative test method that would add these constant values to the energy and water use measured pursuant to Appendix C1, as well as a constant water consumption value to determine the detergent quantity for testing. Whirlpool also provided the additional information and calculations below in support of its alternative test method.

Further detail and calculation method:

“Drain out” event (if dishwasher is not used for 3 or more days) - The “drain out” event consumes an additional 1.02 gallons of water for the cycle in which it occurs. Consumer research shows that only seven percent of consumer cycles, for consumers who run approximately 215 cycles/year, have longer than a three day delay between cycles. This results in “drain out” water and energy usage of 0.072 gallons/cycle and 2.61 kWh/year:

- 7 percent of 215 cycles/year equates to 15.1 cycles/year.
- 15.1 cycles/year multiplied by 1.02 gallons/cycle results in 15.4 gallons/year of additional water usage for “drain out” events.
- 15.4 gallons/year apportioned across all 215 cycles calculates to 0.072 gallons/cycle.

- The “drain out” event water energy consumption, based on 15.4 gallons/year, calculates to 2.59 kWh/year (15.4 gallons/year multiplied by 70 deg. F water heater temperature rise multiplied by the constant K of 0.0024 kWh/gallon/deg. F).
- The additional machine energy consumption associated with a “drain out” event is less than 0.001 kWh/event or 0.02 kWh/year.
 - Pump and valve: 10 W for 4.5 minutes followed by 30 W for 0.5 minutes; 7 percent of 215 cycles/year is used for the calculation.

“Clean out” event (every 30 days or 30 dishwasher cycles whichever occurs first) - The “clean out” event consumes an additional 1.24 gallons of water for the cycle in which it occurs. Water is heated during the “clean out” event. A “clean out” event will occur every 30 days (used for this calculation) or 12.2 events/year. 12.2 events/year, based on 215 cycles/year, calculates to 6 percent of all dishwasher cycles. Water and energy use (apportioned) are 0.071 gallons/cycle and 10.3 kWh/year:

- 1.24 gallons/event multiplied by 12.2 events/year calculates to 15.1 gallons/year of additional water usage for “clean out” events.
- 15.1 gallons/year apportioned across all 215 cycles calculates to 0.071 gallons per cycle.
- The “clean out” event water energy consumption, based on 15.1 gallons/year, calculates to 2.54 kWh/year (15.1 gallons/year multiplied by 70 deg. F water heater temperature rise multiplied by the constant K of 0.0024 kWh/gallon/deg. F).
- The additional machine energy consumption associated with a “clean out” event is 7.72 kWh/year from pump, valve, and heater operation.

- Pump and valve: Approximately 0.006 kWh per event or 0.073 kWh per year
(electrical components use an additional 30 W for a combined duration of 9 minutes plus 10 W for a combined duration of 8.5 minutes; the calculation is based on 12.2 events per year).
- Pump and heater: 1.24 gallons of water is heated for approximately 47 minutes using 800 watts, or 0.63 kWh/event. This calculates to 7.65 kWh/year based on 12.2 events/year.

Calculation of detergent concentration:

A portion of the water fill volume comes from saved water fill instead of the house supply water fill. This saved water fill amount (0.80 gallons) should be included with (added to) the house supply water fill amount (0.11 gallons) when calculating detergent concentration for the wash (a total of 0.91 gallons). The method to determine the saved water fill volume is affected by several factors including when the first cycle is run on a new dishwasher and “charging” of the sump and water lines. Two approaches may be used to determine the amount of water in the first fill:

1. Use a constant amount of water for the wash fill of 0.91 gallons. This is the recommended approach and is representative.
2. Measure the amount of drain water discharged during the first drain out. Measure this amount during the second preconditioning cycle. This would be approximately 0.91 gallons.

Assertions and Determinations

Whirlpool's Petition for Waiver

On July 3, 2013, Whirlpool filed a petition for waiver from the test procedure applicable to residential dishwashers set forth in 10 CFR part 430, subpart B, appendix C1 for particular models of dishwasher equipped with a “water use system.” On August 9, 2013, DOE published Whirlpool’s petition for waiver and granted Whirlpool an interim waiver from the current test procedure. 78 FR 48661.

DOE received one comment on Whirlpool’s petition from BSH Home Appliance Corporation (BSH). BSH stated that the annual energy consumption and water consumption contributions associated with “drain out” should be 41.75 gallons per year and 7.05 kilowatt-hours (kWh) per year instead of 15.4 gallons per year and 2.6 kWh per year as included in the original petition for waiver. BSH based its calculations on data presented in a report by Arthur D. Little (ADL) that was used in support of the 2003 test procedure final rule. 68 FR 51887 (August 29, 2003). Whirlpool provided a rebuttal of BSH’s comment on September 20, 2013 stating that they disagree with BSH’s conclusions and maintain the calculations in the interim waiver are consistent with the precedent set by DOE and implemented by stakeholders; therefore, Whirlpool asserted that their original calculations should continue as the foundation of the Petition for Waiver. DOE notes that the data presented in the ADL report show the distribution of annual cycles among the surveyed consumers, but do not present further information regarding the typical intervals between consecutive cycles. The calculations provided by BSH include assumptions regarding the typical cycle interval, but these are not necessarily representative of consumer behavior. For example, if the number of annual cycles results in greater than a 3-day average interval between cycles (i.e., 121 annual cycles or less),

the BSH calculations assume every cycle per year will have a “drain out” event. In reality, consumers with greater than 3-day average intervals between cycles will likely run a portion of the annual cycles within 3 days of each other, so it is likely that less than 100-percent of these cycles will have a “drain out” event. When the average interval between cycles is less than 3 days (i.e., more than 121 annual cycles), BSH’s calculations still assume a portion of the cycles will have a “drain out” event, reflecting that some cycles likely are not run within 3 days of the previous cycle. As a result, DOE concludes that the BSH calculations likely overestimate the annual energy consumption and water consumption associated with “drain out” events because they assume the “drain out” occurs on every cycle for the consumers with less than 121 annual cycles, but also assume that some “drain out” events occur for consumers with more than 121 annual cycles. To consistently apply cycle interval data inferred from the ADL data, if the calculations assume that “drain out” events occur for all cycles for consumers with average intervals between cycles greater than or equal to 3 days, then no “drain out” events should be assumed for consumers with average intervals between cycles of less than 3 days. Doing so would decrease the annual “drain out” energy consumption to 2.93 kWh per year, and the water consumption to 17.3 gallons per year. These values are close to Whirlpool's estimates of 2.6 kWh per year and 15.4 gallons per year, which are based on consumer research that includes information on intervals between cycles. Given the uncertainty in estimating cycle intervals from the ADL report, DOE concludes that Whirlpool’s estimates are reasonable and is not revising the values that were included in the alternate test procedure as presented in the interim waiver published on August 9, 2013. 78 FR 48661.

BSH also stated that DOE should consider removing two additional requirements: the requirement for a new dishwasher to be used in testing and, if more than 68 hours elapse between test cycles, the requirement to disconnect and reconnect power to the dishwasher to restart the test series. According to BSH, these two requirements may offer a means to circumventing the test procedure. In Whirlpool's September 20, 2013 rebuttal, they also disagree with BSH assessment. DOE notes that while Whirlpool included the requirement for a new machine for testing as part of its petition for waiver, DOE did not include this requirement in the alternate test procedure set forth in the interim waiver granted to Whirlpool. Such a requirement would impose an unreasonable burden when multiple tests are conducted.

DOE did, however, include in the alternate test procedure the requirement to disconnect and reconnect power to the machine if a "drain out" or "clean out" event occurs during a test series, and to subsequently restart the test series with the controls reset. This approach would not place burden on test laboratories by requiring them to monitor the time intervals between cycles and number of cycles throughout multiple tests. Should laboratories choose to do so, DOE included the 68-hour maximum interval between test cycles as an informative means for avoiding "drain out" events during testing. Because testing is conducted on products that are in their initial state disconnected from the power supply, the conduct of the test procedure after disconnecting power after a "drain out" or "clean out" event is the same as the conduct of any test in which the test series is begun by connecting power to the machine and starting the test cycles. In each case, a "clean out" event would take place during the first cycle after power is supplied to the machine. For these reasons, DOE is maintaining the testing provisions included in

the alternate test procedure set forth in the interim waiver published on August 9, 2013. 78 FR 48661.

Therefore, for the reasons discussed above, DOE grants Whirlpool's petition for waiver from testing of its KitchenAid brand basic model KDTE554C++# dishwasher equipped with a "water use system."

Consultations with Other Agencies

DOE consulted with the Federal Trade Commission (FTC) staff concerning the Whirlpool petition for waiver. The FTC staff did not have any objections to granting a waiver to Whirlpool.

Conclusion

After careful consideration of all the material that was submitted by Whirlpool and consultation with the FTC staff, it is ordered that:

(1) The petition for waiver submitted by Whirlpool Corporation (Case No. DW-011) is hereby granted as set forth in the paragraphs below.

(2) Whirlpool shall be required to test and rate the following Whirlpool models according to the alternate test procedure set forth in paragraph (3) below.

KitchenAid brand:

Basic Model – KDTE554C ++ #

(3) Whirlpool shall be required to test the products listed in paragraph (2) above according to the test procedures for residential dishwashers prescribed by DOE at 10 CFR part 430, subpart B, appendix C1, except that, for the Whirlpool products listed in paragraph (2) only with the following:

“Water use system” water and energy consumption shall be accounted for during dishwasher water and energy measurement and reporting. The following is a summary of the additional modifications required:

- For “drain out” events, constant values of 0.072 gallons per cycle and 2.6 kWh / year shall be added to values measured by appendix C1.
- For “clean out” events, constant values of 0.071 gallons per cycle and 10.3 kWh / year shall also be added to values measured by appendix C1.
- To calculate the detergent quantity for testing, a constant value of 0.91 gallons for the water fill amount shall be used, representing both saved water fill and house supply water fill.
- If a “drain out” or “clean out” event occurs during testing, any results from that use of the test procedure shall be disregarded. Disconnect and reconnect power to the dishwasher, then restart the test procedure.
 - To detect a “drain out” event, measure the water volume supplied during the first fill. A cycle shall be considered to have a “drain out” event if the first fill uses approximately 1 gallon from the water supply. Without a “drain out” event, the first fill would use approximately 0.11 gallons from the water supply.
 - To detect a “clean out” event, monitor the temperature of the sump water using an additional temperature measuring device. The device shall be placed inside the sump in

an area such that the device will always be submerged in water and will not interfere with the operation of the dishwasher. A cycle shall be considered to have a “clean out” event if the temperature of the sump water during wash and rinse portions of the cycle reaches 150 deg. F. Without a “clean out” event, the highest sump water temperatures would reach approximately 140 deg. F.

- It is recommended that all testing be completed within 28 days, and within 28 cycles of first dishwasher use, to avoid a “clean out” event. No more than 68 hours should lapse between the start of cycles to avoid a “drain out” event. Cycles include preconditioning cycles as well as test cycles.

Other testing requirements or considerations:

To confirm if saved water has returned to room ambient temperature, a thermocouple may be placed on the surface of saved water tank to measure temperature. Reference section 2.5.1 of appendix C1.

Removing power from the dishwasher will result in a “clean out” event during the next dishwasher cycle. As required by section 2.2.1 of appendix C1, it is necessary to maintain a continuous electrical supply to the unit throughout testing, including during preconditioning cycles and the test cycle series.

(4) Representations. Whirlpool may make representations about the energy use of its dishwasher equipped with a “water use system” products for compliance, marketing, or other purposes only to the extent that such products have been tested in accordance with the provisions

outlined above and such representations fairly disclose the results of such testing.

(5) This waiver shall remain in effect consistent with the provisions of 10 CFR 430.27(m).

(6) This waiver is issued on the condition that the statements, representations, and documentary materials provided by the petitioner are valid. DOE may revoke or modify this waiver at any time if it determines the factual basis underlying the petition for waiver is incorrect, or the results from the alternate test procedure are unrepresentative of the basic models' true energy consumption characteristics.

(7) This waiver applies only to those basic models set out in Whirlpool's July 3, 2013 petition for waiver. Grant of this waiver does not release a petitioner from the certification requirements set forth at 10 CFR part 429.

Issued in Washington, DC, on October 28, 2013.

Kathleen B. Hogan
Deputy Assistant Secretary for Energy Efficiency
Energy Efficiency and Renewable Energy

[FR Doc. 2013-26085 Filed 10/31/2013 at 8:45 am;

Publication Date: 11/01/2013]